Stormwater Management
FOR EASTERN WASHINGTON

SUMMARY OF SUBCOMMITTEE MEETING

DATE: May 31, 2002 [Revised: June 6, 2002]

TO: Ross Dunfee, Steering Committee Chairman
Tony Barrett, Department of Ecology

COPY: Stormwater Manual Subcommittee Members and Consultant Team

FROM: Jim St. John, DEA and Dave Moss, Tt/KCM

SUBJECT: **Summary of Stormwater Manual Subcommittee Meeting**
Moses Lake Conference Center
May 23, 2002 9:00 am – 3:30 pm

PROJECT: EASTERN WASHINGTON STORMWATER MANAGEMENT
Stormwater Management Technical Manual *and*
Model Municipal NPDES Phase II Stormwater Program

Subcommittee Meeting Attendees: Revised 6/6 to match Tony's list

John Hohman – Spokane County	Steve King – RH2 Engineering
Steve Worley – Spokane County	Steve Hansen – City of Spokane
Jocelyne Gray – JUB Engineers	Gary Nelson – Spokane County
Dave Moss – TetraTech	Jim St. John – DEA
Greg Lahti – WSDOT	Gary Beeman - WSDOT
Nancy Aldrich – City of Richland	Khalid Marcus – Yakima County
Karen Dinicola – Ecology	Ryan Lyyski – City of Ellensburg
Dave Kliewer – JUB Engineers	Sandra Levey – Grant County PUD
Tony Barrett – Ecology	Mitch Reister – WSDOT
Mel Schaefer - MGS	
Jim Harakas - GeoEngineers	

PURPOSE OF MEETING:

This meeting was held to gather the core subcommittee members and at-large members for:

- Discuss Updated Production Schedule; Review Key Issue Summary
- Presentation and Discussion of Redevelopment, Infiltration Rates and Testing, and Design Storms
- Second review of Chapter 4 (Hydrologic Analysis), Chapter 6 (Water Quality Facility Design), and Chapter 8 (Source Control)
- Continued discussion of Issue Papers 3 and 4

AGENDA FOR THIS MEETING:

1. Review of Subcommittee agenda and summary from 5/9 meeting
2. Review latest schedule and status of key issues
3. Redevelopment Considerations and Discussion
4. Soil Characterization and Infiltration Rates
5. Discuss Issue Paper #3
6. Water Quality Design Storms and Infiltration Facility Sizing
7. Discuss Issue Paper #4
8. Brief review of Issue Papers 3 and 4
9. Lunch break
10. Review revised draft of Chapter 4 (Hydrologic Analysis and Design)
11. Review revised draft of Chapter 6 (Water Quality Facility Design) – *not reviewed*
12. Review revised draft of Chapter 8 (Source Control) – *not reviewed*
13. Adjourn Subcommittee meeting

BRIEF SUMMARY OF PROCEEDINGS:

1. Dave Moss presented the agenda and a summary of the May 9 meeting.
2. Dave presented the schedule for the next couple months.
3. Dave Moss reviewed each item on the key issue list that was handed out. The following changes were made to the key issues. A revised issue list will be presented at each meeting.
    a. Chapter 4:
        1) Gary Nelson thought snowmelt had been deleted in Issue Paper #4 discussion last meeting, and resolved. Steve W. and Jim S. noted that the term had been deleted and replaced with "design storm" which would be resolved later and could still include a snowmelt factor. See items 10.e. and 10.f. below for further discussion and resolution.
    b. Chapter 6:
        1) The treatment facility process chart was discussed but will not be resolved until Chapter 6 is reviewed.
4. Redevelopment Presentation – by Karen Dinicola
    a. Karen Dinicola and Greg Lahti prepared a definition of redevelopment and proposed thresholds for discussion. See Powerpoint presentation for details.
    b. Karen said the flow chart began with a "start here" box. Tony agreed that was important based on Western Washington manual experience.

c. There was discussion whether the redevelopment threshold should be based on value or area. Comments were: value is very difficult to determine, desire ratio of areas, and consider date of current construction.

d. There was discussion whether redevelopment should be optional guidance? Would this depend on whether there are environmental problems caused by existing development?

e. There was discussion whether standard is based on existing or predeveloped conditions for flow control. The majority of the committee wanted to use existing.

f. Nancy Aldrich suggested adding the following to the recommendation: "if there is existing flow control/environmental problem or local jurisdiction does not have redevelopment policy in place." Tony defined environmental problem as 303(d) listed water body or locally defined sensitive areas.

g. Request was made to consider a cost cap to improvements.

h. Greg and Karen to revise redevelopment definition and thresholds and coordinate with Dave for incorporation into Chapter 2 by July 11 meeting.

5. Infiltration Presentation – by Jim Harakas

a. Jim H. presented the memorandum regarding infiltration rates dated May 17, 2002 with an emphasis on Table 1 in his handout, which compares USDA textural soil classification to Unified Soil Classification and presumptive infiltration rates.

b. Jim H. recommends only using SCS Soil Maps for determining curve numbers and not for infilltration design.

c. Jim H. recommends indirect determination of infiltration design rate – base rate upon laboratory analysis and ASTM classification.

d. The term "surface BMPs" in Table 1 of the memo are for water quality and should be put in Chapter 6.

e. The term "subsurface BMPs" in Table 1 of the memo are for water quantity and should be put in Chapter 5.

f. Greg said WSDOT is proposing to use size of D10 material to set infiltration. How does this compare? Jim H. thinks it is similar, but will check.

g. Tony would like the column listing the USDA soil types to be left in for subsurface BMPs, for reference.

h. Steve King concerned about consolidated gravels in Central Washington. Lab rates may vary from field condition. Requires percolation test during construction.

i. There were questions about determining presumptive infiltration rates. Current rates are based on Spokane County design guidelines for drywells. Tony requested that rates in Table 1 be long term design rates. The rates in Table 1 for subsurface BMPs with high infiltration rates are the long term design rates for Spokane County. However, the rates in Table 1 for surface BMPs for water quality treatment are not long term design rates.

j. There was a concern that infiltration rates are too high for Central Washington. Steve King and Ryan Lyyski said rates they've seen include:

   1) Ellensburg – 20 in/hr

2) Wenatchee – 0.5 in/hr

k. Nancy requested that cities and consultants send local presumptive rates to Dave Moss so this can be evaluated.

l. Jim H. recommends that site suitability criteria for slope setback should be height of slope.

6. Issue Paper #3 Presentation – by Tony Barrett

   a. Subcommittee requests ability to discharge moderate and heavy pollutant loadings. May require additional treatment of pollutants of concern.

   b. Tony removed geologic matrix from chart.

   c. Group requested local options to have flexibility to allow site specific analysis.

   d. Tony suggested option to use low, moderate, high susceptibility CARA ratings on matrix. Steve agreed and suggested that CARA rating be added to first line of the matrix, above depth to groundwater.

7. Design Storms – by Mel Schaefer

   a. Mel handed out copy with dates and locations of 57 storm records, and presented development of 6-hour and 72-hour hydrographs.

8. Recommendation for Sizing Infiltration Swales – by Mel Schaefer, and
   Issue Paper #4 Discussion – by Jim St. John

   a. Tony wants to emphasize that for infiltration facilities other than infiltration swales such as infiltration trenches and ponds, the site specific design option will be required.

   b. For look-up table, add note that "storage criteria is based on 6-month long duration criteria, but not shown."

   c. For the rational equation option, Tony would like threshold area for when this option is applicable.

   d. Discussion about why peak flow based BMP uses 2-year rather than 6-month storm. Greg to compare biofiltration swale sizing based on:

      1) 6-month short duration storm

      2) 2-year short duration storm

      3) SCS Type 2, 6-month 24-hr storm (64% of 2-yr storm) (current WSDOT method)

      WSDOT Biofiltration swale design criteria are: Depth = 4", Length = 200 feet, Velocity $\leq$ 1 ft/s.

9. Tony said manual equivalency would be based on meeting goals of regional manual, but local jurisdictions could restrict or add options. Add a manual equivalency statement and local government options to the Introduction in Chapter 1.

10. Chapter 4 was reviewed and discussed.

    a. Are there options to use SCS unit hydrograph rather than SBUH? What is the difference?

    b. Clarify that design methods are for flow control and water quality design – not for conveyance systems.

    c. During next month, DEA to compare hydograph results.

d. Provide example on how to use hyetograph – getting precipitation depth and scaling hyetograph.

e. Snowmelt factor was discussed. WSDOT doesn't consider this for runoff because roads are plowed. They would consider it in culvert sizing.

f. A snowmelt factor is not desired by Subcommittee, so it was agreed to make the snowmelt factor optional.

g. Karen asked where did curve numbers come from? Jim S. said draft Spokane County Manual. These curve numbers are an outdated set of TR-55 CNs from 1979.

   1) Karen and Subcommittee requested DEA to refer to TR-55, 1986 or latest update (similar to Western Washington manual) for curve numbers.

   2) Provide conversion from wet condition to dry condition, if applicable.

   3) Karen requested adding designated curve numbers for predeveloped conditions. This will be reviewed but the majority of the Subcommittee would like the design to be based on current existing conditions rather than historic.

h. Be specific about design criteria objective. Be more general about how to do design. Provide all specific information needed for Eastern Washington. Don't need to restrict curve numbers for now – provide Table from TR-55.

i. Provide references and highlight issues to address.

11. Chapters 6 and 8 were not reviewed.

12. Nancy proposed second meeting in June on 6/27 at 9:00 am.

13. Karen stated Ecology is reviewing Chapter 7. Ecology plans to have preliminary comments ready for the 6/13 meeting. The goal is to have the full comments available by the June 27 meeting.

PRELIMINARY AGENDA FOR NEXT MEETING:

The **next meeting** will be at the Moses Lake Conference Center on **June 13, 2002**, from 9am to 3:00pm. The agenda will include:

- Review of Subcommittee agenda and summary from 5/23 meeting
- Review latest schedule and status of key issues
- Approve file copies of Issue Papers 1 and 2
- Discuss Issue Papers 3 and 4; finalize if possible
- Discuss Redevelopment recommendations
- Review initial draft of Chapter 1 (Introduction)
- Review revised draft of Chapter 5 (Infiltration and Detention Design)
- Lunch break (15 minutes) – *bring your own if you wish*
- Review revised draft of Chapter 6 (Water Quality Facility Design)

- Review revised draft of Chapter 8 (Source Control)
- Review the preliminary cost estimates for BMPs
- Review revised draft of Chapter 3 (Drainage Plan)

The following text are the notes from the flip charts (created at the meeting) from participant comments:

Redevelopment

- Add: "Start Here"; add ≥ 1 acre
- Cost thresholds can be difficult to implement; consider area ratios; date?
- Does/should apply to all of Eastern Washington? (Should it be optional/local?)
- What is the "standard"? Should it be a % of the area or cost?
- ….if local jurisdiction does not have a policy in place, or if there is a flow control and/or environmental problem.
- Cap $ amount?

Soil Characterization/Infiltration

- (1) Eliminate use of USDA triangle except for surface hydrologic analysis
- (2) use ASTM methods
- Need table for subsurface quantity BMP?
- Suggest leaving USDA in for cross-reference
- What about difference between insitu and lab results?
- What about inconsistent "opinions"?
- Professionals: civils, geotech, etc… (whom is appropriate/qualified?)
- Presumptive rates – include safety factor
- Consider regional variability
- Reconsider setback criteria; suggest minimum setback ≥ height of slope, unless proved otherwise; not some pre-specified distance or dimension

Issue Paper #3 – Drywells

- Added "subsurface injection"
- Removed geologic matrix; focus on depth to water table
- There is not a scientific basis to depth increments
- Should consider allowing discharge if proper pretreatment is provided
- "Discharge" to groundwater and/or surface water?
- Allow local requirements; local conditions (…at the option of local government…)
- "Prohibited" ← update this phrasing
- How to deal with future land use changes?
- CARA* - should this be referenced or not?
  *use low/moderate/high
- The numerical CARA ratings referred to in Issue Paper #3 may not apply to all of Eastern Washington, since some jurisdictions may have used a different process to characterize susceptibility

Design Storms

- Propose 6mo-72hr for WQ volume
- Propose 2yr-72hr for WQ flow rate
- NOAA 6hr maps – "mixed"; 6hr window
- Factors & tables → other than 2yr

WQ Facilities

- Option 3 - can be used for swales and wet ponds; must be used (at this time) for all other BMPs
- *Use 2-yr 24-hr value to "get to" 6mo-72hr
  *add note to table to clarify this
- The lower infiltration rate values (e.g., 0.15 & 0.41) are used in sizing calculation
- Show example of Option 3 using spreadsheet method

Issue Paper #4 – WQ Design Storms

- Route 85% through BMP
- "First flush" may still be applicable in Eastern Washington
- 2yr-6hr is less than what percent of storms
- Is 2yr-6hr a greater percentage than 90% - 95%?
- Calculate an example; WSDOT to compare present method vs. 2yr-6hr
  SCS Type II/64% gets 6mo-24hr vs. 2yr-6hr
- Allow local jurisdiction to allow or disallow any particular method or option as they deem appropriate.
- Repeat at beginning of each chapter: "Local jurisdictions may approve one or more of the following…."

Chapter 4 - Hydrologic Analysis & Design

- Add "local agency" can specify…
- Clarify "10 acres" doesn't apply to conveyance
- Run "samples" to compare SBUH with other models
- Delete "flood"
- Snowmelt – optional; add text to guide its use
- Maps – remove gray shading for cities; e-mail comments
- Be specific about objective, but more general about how to do it
- Need curve numbers for predeveloped?